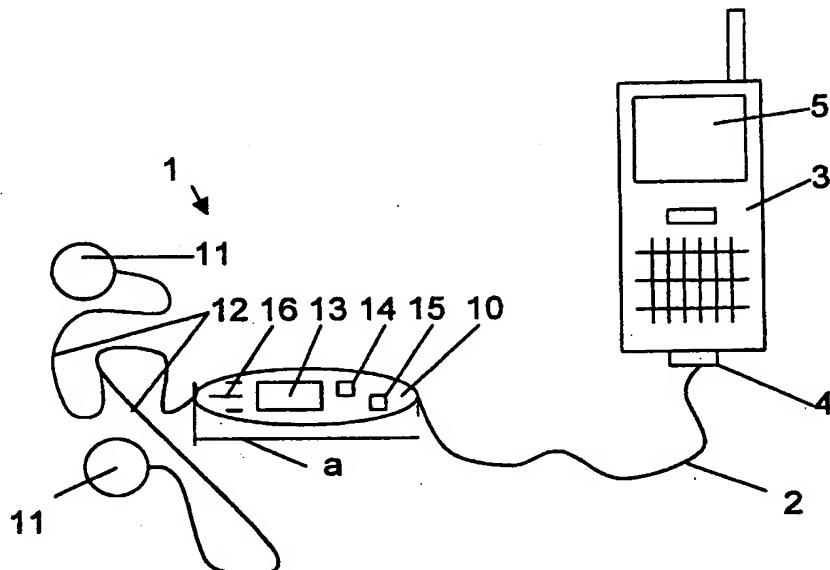




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(54) Title: A DEVICE FOR CONTROLLING A CELLULAR TELEPHONE



## (57) Abstract

The invention refers to a device for controlling a mobile telephone (3) with a plurality of functions, comprising an answering function for a call from another subscriber and a calling function for a call to another subscriber. The device (1) comprises a separate control unit (10), a connecting member (2) for connecting the control unit (10) to a communication port of the mobile telephone (3), a microphone (16) associated with the control unit, and a loudspeaker (11) associated with the control unit. The control unit (10) comprises at least one information providing member (13) and a control member (14, 15). The control member is arranged to provide a user with information related to said functions via the information providing member and to allow activating of said functions by means of the control member.

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**A device for controlling a cellular telephone**

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**BACKGROUND OF THE INVENTION AND PRIOR ART**

The present invention refers to a device for controlling a mobile telephone with a plurality of functions, comprising  
10 an answering function for a call from another subscriber and a calling function for a call to another subscriber, wherein the device comprises a separate control unit, a connecting member for connecting the control unit to a communication port of the mobile telephone, a microphone associated with  
15 the control unit, and a loudspeaker associated with the control unit.

Such devices for mobile telephones are often named "hands-free". These are available in a large number of  
20 accomplishments. The simplest types comprise in principle only a microphone and a loudspeaker, wherein the mobile telephone is operated in a common way by the normal keyboard of the mobile telephone. Today, there are also "hands-frees" that comprise a control key, by which the mobile telephone  
25 can be activated at an incoming call or turned off if one does not desire to receive the call. However, these known devices have the disadvantages that in many situations one is bound to take up the mobile telephone to get at the keyboard of the mobile telephone and achieve desired  
30 functions.

US-A-5,557,563 shows a separate device with a loudspeaker, a microphone, and a control unit. The device is intended to be connected to a common wireless telephone and is not designed  
35 to be used together with a mobile telephone.

## SUMMARY OF THE INVENTION

The object of the present invention is to provide a device, by which a user can utilise his mobile telephone for a large 5 number of common functions without using the normal keyboard of the mobile telephone.

This object is achieved by the initially defined device which is characterised in that the control unit comprises at 10 least one information providing member and a control member, wherein the control member is arranged to provide a user with information related to said functions via the information providing member and to allow activating of said functions by means of the control member.

15 By such a device, a user can utilise fundamental, normal functions of a mobile telephone. The user obtains information about the status of the mobile telephone via the information providing member and can, from this information, 20 activate different functions by means of the control member. Advantageously, the control unit is arranged to provide a user with information about a calling subscriber by means of the information providing member before the answering function is activated. Thus, by such a number information, a 25 user can find out who is calling before answering the mobile telephone without needing to pick up the mobile telephone. Furthermore, by means of the control member and the information providing member, the control unit can be arranged to allow selection of one of a number of 30 subscribers, and thereafter activate the calling function for calling the selected subscriber. Consequently, the user can obtain information about a number of subscribers via the information providing member and activate the control unit when the information providing member indicates a desired 35 subscriber.

According to an embodiment of the invention, the control member comprises a first operating position for activating one of said functions and a second operating position for said selection. For that purpose, the mobile telephone can  
5 be arranged to provide a directory containing said number of subscribers and the control member in the second operating position can be arranged to allow said selection of one of said number of subscribers by means of a search in said directory, wherein the information providing member is  
10 arranged to inform about found subscribers during said search, and wherein the control member in the first operating position is arranged to activate the calling function with respect to the found subscriber. Thus, by guiding the control member to the first operating position,  
15 a user can browse among the subscribers stored in the directory. At the same time, the user obtains information about which subscriber for the moment has been found. When the desired subscriber has been found in the directory, the user can activate the calling function by guiding the  
20 control member to the second operating position, and thus in an easy way call the desired subscriber.

According to a further embodiment of the invention, the control member comprises at least one key for achieving said  
25 operating positions. Such a key can have a centre zero position and by guiding the key in one direction, the first operating position is reached, and in the other direction, the second operating position is reached. Preferably, the key resiliently returns to the centre zero position. The  
30 control member may also comprise two keys, wherein a pressing on these corresponds to a first operating position and a second operating position, respectively.

According to a further embodiment of the invention, the information providing member comprises a display member.  
35 Thus, a user can see on the display member, for instance

- which subscriber is calling or follow the search of said number of subscribers in the directory. As an alternative or a complement, the information providing member may also comprise a member to accomplish synthetic speech via the
- 5      loudspeaker. With such synthetic speech it is thus possible to tell the user which subscriber is calling or which subscriber has been found for the moment in the directory at a search therein.
- 10     According to a further embodiment of the invention, the control unit comprises a processor member, for instance a micro processor of the type Digital Signal Processor, DSP, by which the above mentioned functions can be accomplished.
- 15     According to a further embodiment of the invention, the control member comprises means arranged to allow achievement of said operation positions by means of voice control. Thus, in this manner, a user can achieve said operating positions by voice commands. In that way, the user does not need to
- 20     use his hands at all to activate the mobile telephone. Advantageously, the control unit comprises a memory member which is connected to the processor member and arranged to store voice commands.
- 25     According to a further embodiment of the invention, the connecting member comprises an electric cable. However, it is also possible to let the connecting member comprise an IR-communication or a Bluetooth-communication.
- 30     According to a further embodiment of the invention, the device comprises a housing arranged to accommodate the control unit and the microphone. Such a housing may have a suitable design and be designed in a suitable size.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is now to be explained more closely by means of a description of different embodiments and with reference to the appended drawings.

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Fig. 1 discloses the device according to the invention together with a mobile telephone.

Fig. 2 discloses schematically a block diagram of a first embodiment of the device according to the invention.

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Fig. 3 discloses schematically a block diagram of a second embodiment of the device according to the invention.

15

Fig. 4 discloses schematically a third embodiment of the device according to the invention.

## DETAILED DESCRIPTION OF DIFFERENT EMBODIMENTS OF THE INVENTION

20

Fig. 1 discloses a device 1 according to the invention, which via a connection 2 is connected to a mobile telephone 3. The mobile telephone 3 is of a conventional type and comprises a communication port 4 for connecting of external equipment, for instance of the type "hands-free". The mobile telephone 3 comprises the common functions of a mobile telephone, such as an answering function for a call from another subscriber, a calling function for a call to another subscriber, a directory function for storage of a number of telephone numbers which a user employs more frequently than others, a number information function, which provides a user with information about the telephone number or the name of a calling subscriber, etc. The prevailing status concerning the different functions can, on the display 5 of the mobile telephone 3, be followed by a user. In this application, the other telephone or another communication apparatus, which a

35

user communicates with via the mobile telephone 3, is named a subscriber for the sake of simplicity.

The device 1 comprises, besides the connection 2, a control unit 10 and one or two loudspeakers 11, preferably of the earphone type. In the disclosed embodiment, the device 1 comprises two loudspeakers 11, which are connected to the control member 10 via an electric cable 12, respectively. It is advantageous with more than one loudspeaker 11 when the device 1 is utilised for listening to music, for instance by means of the so-called MP3-technique. The control unit 10 is disclosed more closely in Fig. 2. The control unit 10 comprises an information providing member in the form of a display member 13, a control member in the form of two keys 14 and 15, a microphone 16, a connecting member 17 by which the control unit 10 is connected to the connection 2, and a microprocessor 18. As will be seen from Fig. 2, all components, i.e. the loudspeakers 11, the display member 13, the keys 14, 15, the microphone 16, and the connecting member 17 are connected to the microprocessor 18, which consequently is arranged to control and monitor all components of the device 1. The microprocessor 18 can be a microcomputer of different types, for instance a digital signal processor, DSP. The connection 2, which connects the communication port 4 and the connecting member 17 may, according to a first embodiment, comprise an electric cable with a number of conductors for transmission of different signals. According to other embodiments of the invention, the connection 2 may comprise a IR-communication or a Bluetooth-communication.

The keys 14 and 15 can be shaped physically in many different ways. For instance, the control member may comprise only one key, which can be displaced in two different directions for achievement of different operating positions. It is also possible to provide the device with

more than the two shown keys 14, 15. Preferably, the keys comprise an activating key 14 and a selection key 15, which are more closely explained below.

5      The display member 13 can be a display of a conventional LCD-type and of such a size that at least one normal telephone number easily can be viewed by a user. Preferably, the display member 13 is designed in such a way that it can replace the display 5 of the mobile telephone 3 and thus  
10     allow reading of, for instance, SMS-messages. The control unit 10 goes into a housing or a casing which has relatively small outer dimensions, for instance with a length a of 3-10 cm, preferably 4-7 cm. When the device is used by a user, the loudspeaker 11 is put into the ear of the user, whereby  
15     the electric cable 12 has such a length that the control unit 10 is located below the face of the user. Thus, by lifting the control unit 10, the user can operate both the keys 14 and 15 with one finger and meanwhile view the information via the display member 13.

20     However, the display member 13 may also be designed as a display member of a less conventional type, for instance a projecting display member, which may comprise means to project the image that is shown by means of the display member 13, for instance on spectacles, which are carried by the user of the device 10. It should also be noted that the display member may be arranged to project the image to be shown to the user directly on the retina of the user by means of laser technique.

30     When another subscriber calls the mobile telephone 3, the telephone number of the calling subscriber, or possibly the name of the calling subscriber, will be shown on the display member 13. The control unit 10 obtains this information via  
35     the connection 2 from the mobile telephone 3. The user can now choose to answer a call by activating the answering

function of the mobile telephone 3. According to one embodiment, that can be done in such a way that the function answer is marked on the display member, whereby the user by pressing the activating key 14 activates the answering 5 function of the mobile telephone 3. If the user does not want to answer the call, he may press the selection key 15, whereby the command quit has been marked on the display member 13. If the user now presses the activating key 14, the call will be discontinued.

10

Also the calling can be managed completely by the disclosed control unit 10. By means of the selection key 15, the user can browse in the directory of subscribers of the mobile telephone 3, wherein a pressing results in that a subscriber 15 is shown on the display member 13. When the display member 13 shows the desired subscriber, users can activate the calling function of the mobile telephone 3 by pressing the activating key 14. In such manner many common functions of the mobile telephone 3 can be totally controlled by means of 20 the device 1 according to the invention.

It is also possible that the information providing member comprises the loudspeaker 11, i.e. a user can obtain information about a calling subscriber, number information, 25 via the loudspeaker 11 by means of synthetic speech. Also when searching in the subscriber directory of the mobile telephone 3, the user can be informed about the gradually fed subscriber numbers, or the names, via the loudspeaker 11 and/or by synthetic speech.

30

Fig. 3 discloses a second embodiment of the invention, which differs from the first embodiment by the fact the control unit 10 also comprises means for voice control. Thus according to a possible variant, the two keys 14, 15 can be 35 replaced or complemented with two voice commands, by which a function can be activated or a selection can be made in a

corresponding way as by the keys 14 and 15. According to a more advanced embodiment, it is, of course, also possible to let the user define, for instance a name of another subscriber, wherein this subscriber automatically is called.

5 In this embodiment, the control unit 10 also comprises a memory member 20, in which suitable voice commands can be stored.

10 The device 1 may also comprise a current source in those cases the voltage that can be obtained from the mobile telephone 3 is not enough, for instance when the communication with the mobile telephone is intended to be effected by means of the above mentioned Bluetooth-technique. Fig. 3 discloses, as an example, a battery 21 arranged in the control unit 10. Advantageously, the battery 15 21 is rechargeable.

20 Fig. 3 also discloses, as an example, a digital camera 22, which is arranged in the control unit 10 to allow transfer of pictures from a user via the mobile telephone 3. The digital camera 22 can be internal, i.e. mounted in the control unit 10, or external, i.e. arranged as a separate unit connected to the control unit 10 by means of some suitable connection.

25 Fig. 4 discloses a third embodiment of the invention, which is intended to allow access and use of a larger number of functions of the mobile telephone 3 by means of the control unit 10. In this example, the control unit comprises a large number of keys 31, 32, 33, 34, and 35, of which, for instance the keys 31 and 32, comprise the above mentioned activating and selection keys, and the key 35 forms a so-called joy-stick. This embodiment is particularly suitable to allow use of those games, which to an increasing extent 30 35 are available in mobile telephones 3. The display member 13 can then be slightly larger than in the first embodiments

and be adapted to different applications. In this case, the above mentioned projecting display member 13 can be particularly advantageous. The control unit 10 also comprises a volume adjusting key 36 for adjustment of the 5 volume of the sound from the loudspeaker 11. Furthermore, this embodiment comprises an additional microphone 37 to allow an improvement of the sound quality of the transmitted sound. Such a volume adjusting key 36 and such an additional microphone 37 can also be comprised by of those embodiments 10 disclosed in Figs. 1-3.

The present invention is not limited to the embodiments described but may be varied and modified within the scope of the following claims.

15 It should be noted that more than one device 1 can be arranged to control the one and same mobile telephone 3. It is also possible to control more than one mobile telephone 3 by the one and same device 1. Those applications of the 20 invention are particularly useful when the connection 2 is wireless and for instance is accomplished by a Bluetooth-communication.

Claims

1. A device for controlling a mobile telephone (3) with a plurality of functions, comprising an answering function for a call from another subscriber and a calling function for a call to another subscriber, wherein the device (1) comprises a separate control unit (10), a connecting member (2, 17) for connecting the control unit (10) to a communication port (4) of the mobile telephone (3), a microphone (16) associated with the control unit, and a loudspeaker (11) associated with the control unit, characterised in that the control unit (10) comprises at least one information providing member (11, 13) and a control member (14, 15, 16), wherein the control member is arranged to provide a user with information related to said functions via the information providing member (11, 13) and to allow activating of said functions by means of the control member (14, 15, 16).
2. A device according to claim 1, characterised in that the control unit (10) by means of the information providing member (11, 13) is arranged to provide a user with information about a calling subscriber before the answering function is activated.
3. A device according to any one of claims 1 and 2, characterised in that the control unit (10), by means of the control member and the information providing member (13) is arranged to allow selection of one of a number of subscribers and thereafter to activate the calling function for calling the selected subscriber.
4. A device according to claim 3, characterised in that the control member (14, 15, 16) comprises a first operating position for activating one of said functions.

5. A device according to claim 4, characterised in that the control member (14, 15, 16) comprises a second operating position for said selections.

5 6. A device according to claim 5, wherein the mobile telephone (3) is arranged to provide a directory containing said number of subscribers, characterised in that the control member (14, 15, 16) in the second operating position is arranged to allow said selection of one of said number of  
10 subscribers by means of a search in said directory, wherein the information providing member (11, 13) is arranged to inform about found subscribers during said search, and wherein the control member (14, 15, 16) in the first operating position is arranged to activate the calling  
15 function with respect to the found subscriber.

7. A device according to any one of claims 5 and 6, characterised in that the control member (14, 15, 16) comprises at least one key (14, 15) for achieving said  
20 operating positions.

8. A device according to any one of the preceding claims, characterised in that the information providing member (11, 13) comprises a display member (13).

25 9. A device according to any one of the preceding claims, characterised in that the information providing member (11, 13) comprises a member to accomplish synthetic speech via the loudspeaker (11).

30 10. A device according to any one of the preceding claims, characterised in that the control unit (10) comprises a processor member (18).

35 11. A device according to claims 5 and 10, characterised in that the control member (14, 15, 16) comprises means (16,

20) arranged to allow achievement of said operating positions by means of voice control.

5       12. A device according to claim 11, characterised in that the control unit (10) comprises a memory member (20) for the processor member (18), which memory member (20) is arranged to store voice commands.

10      13. A device according to any one of the preceding claims, characterised in that the connecting member (2, 17) comprises an electric cable.

15      14. A device according to any of the preceding claims, characterised in that the connecting member (2, 17) comprises an IR-communication.

20      15. A device according to any one of the preceding claims, characterised in that the connecting member (2, 17) comprises a Bluetooth-communication.

25      16. A device according to any of the preceding claims, characterised in that the device comprises a housing which is arranged to accommodate the control unit (10) and the microphone (16).

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FIG. 1

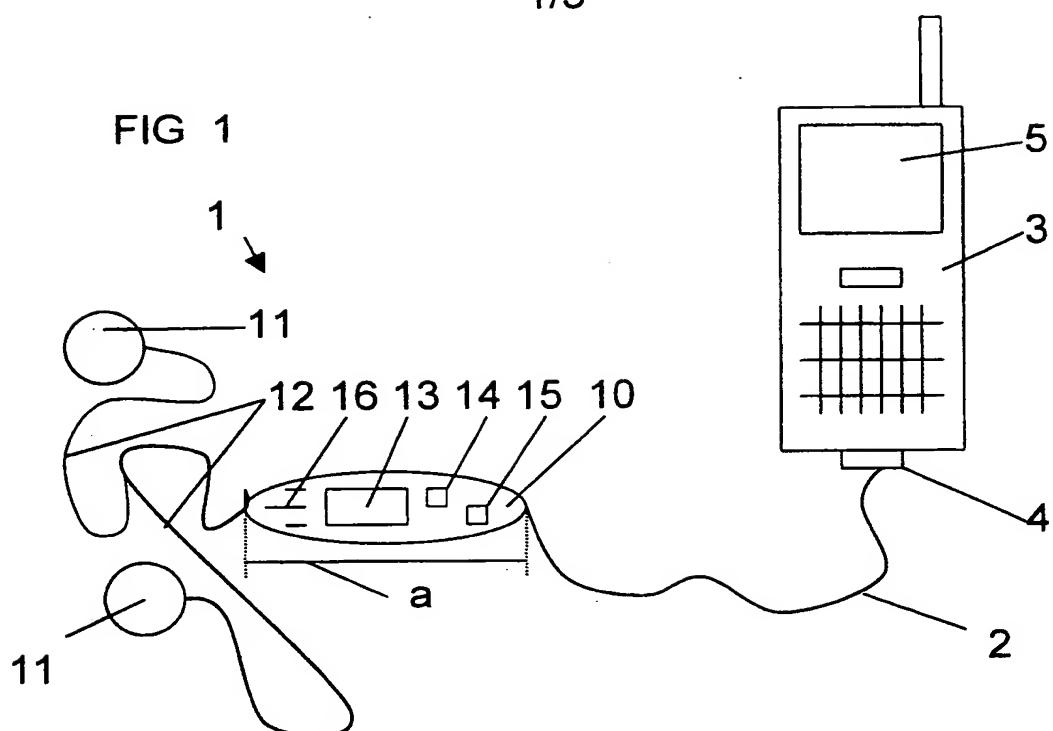
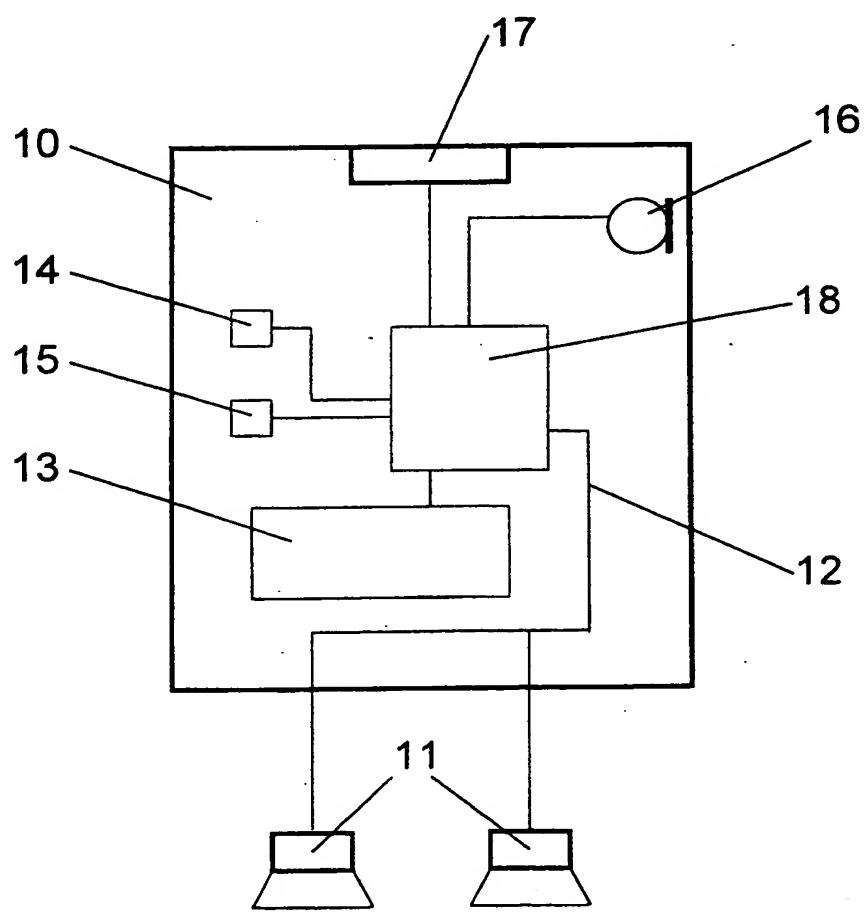
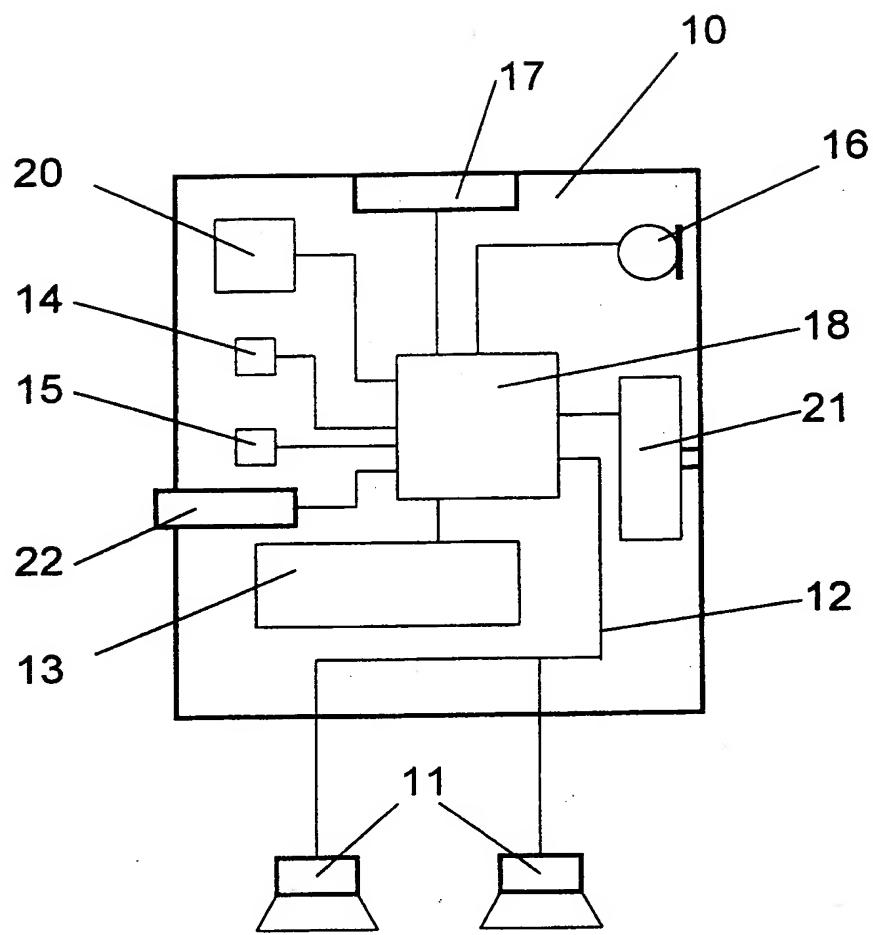


FIG. 2



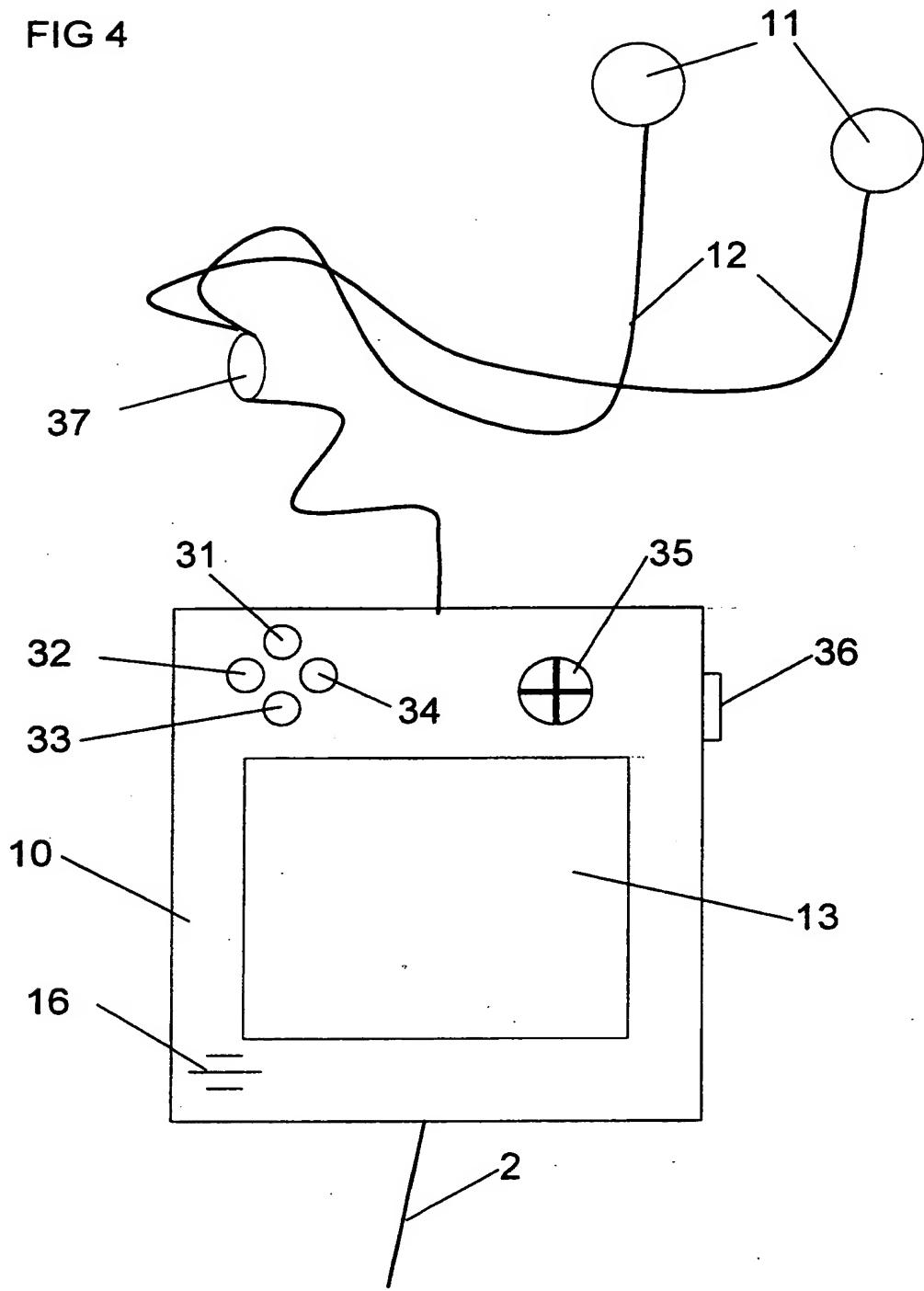
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FIG 3



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FIG 4



## INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/SE 00/00788

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: H04M 1/00**

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Minimum documentation searched (classification system followed by classification symbols)

**IPC7: H04B, H04M, H04Q**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2329737 A (NEC CORPORATION (INKORPORATED IN JAPAN)), 31 March 1999 (31.03.99), page 12, line 19 - page 34, line 2, figures 1A-6C, abstract	1,3-8
Y	--	2,9-16
Y	US 5805672 A (A. BARKAT ET AL), 8 Sept 1998 (08.09.98), column 2, line 41 - column 5, line 46, figures 1-4, abstract	2,9-16
Y	--	2,9-16
Y	EP 0892534 A2 (NOKIA MOBILE PHONES LTD.), 20 January 1999 (20.01.99), column 3, line 33 - column 7, line 56, figures 1-9, abstract	2,9-16
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## INTERNATIONAL SEARCH REPORT

2

International application No.

PCT/SE 00/00788

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ERICSSON REVIEW, Volume 75, No 3, 1998, JAPP HAARTSEN, "Bluetooth - The universal radio interface for ad hoc, wireless connectivity" page 110 - page 117  -- -----	15

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/SE 00/00788**

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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